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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

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Ex parte Benning et al.

Application Serial No. 09/976,167
Filed: October 12, 2001

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Date: May 16, 2007
Examiner: Shamim Ahmed
Group Art Unit: 1765

**APPELLANT'S REPLY BRIEF (37 C.F.R. 41.41(a)(1))**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant hereby submits this Reply Brief under 37 C.F.R. 41.41(a)(1), in response to the Examiner's Answer mailed March 21, 2007.

## Argument

Although the Examiner's Answer mailed March 21, 2007 has not altered the Appellant's position – i.e., that claims 41-50 are patentable over the cited art references, and the rejections thereof under 35 U.S.C. 103(a) should be reversed for the reasons set forth in the Appeal Brief filed December 27, 2006 – the Appellant feels compelled to respond to an aspect of the Examiner's Answer involving a new interpretation of the teachings of the cited art references that was not specifically addressed in the Appeal Brief. More specifically, the Examiner's Answer sets forth a new interpretation with respect to the teachings of the Burton et al. reference (U.S. Patent No. 6,083,838) and the Hartog et al. reference (U.S. Patent No. 6,236,542), which references are applied in combination under 35 U.S.C. 103(a) against claims 45-50. The Examiner's new interpretation is reproduced below, followed by the Applicant's response.

The Examiner's Answer at page 6, line 19 – page 7, line 9, states:

"As to Burton reference, Appellant argues that the surfactant (ethylene oxide propylene oxide block copolymer) used in a metal CMP slurry to inhibit oxide erosion of metal stacks on a semiconductor wafer and this would not be advantageous in the Hartog's super polishing for disk substrate surfaces, which have no metal to be destroyed or damaged by oxide erosion."

"In response to the argument, examiner states that the argument is not persuasive because Hartog illustrates that the disks to be supper polished are typically include metal coating such as aluminum with magnetic material, such as cobalt alloys (see col. 1, lines 21-24 of Hartog reference)."

"Therefore, one of ordinary skilled in the art would have been motivated to introduce Burton et al's surfactant into Hartog's polishing composition for inhibiting metal erosion discussed in the rejection."

First, let's examine the context of the teachings of the Burton et al. reference with respect to its use of a surfactant. The Burton et al. reference proposes to overcome a problem it defines as "oxide erosion", which occurs when semiconductor wafers are subjected to metal CMP (chemical mechanical polishing), by reducing in various ways the rate of exposure of a metal (e.g., metal stacks within a semiconductor wafer) to an oxidant in a CMP slurry. Adding a surfactant to the CMP slurry is one of the ways the Burton et al. reference proposes to reduce the

rate of exposure of the metal to the oxidant. See, for example, Burton et al. col. 2, lines 49-59 and col. 4, line 64 – col. 5, line 12. As argued in the Appeal Brief, one of ordinary skill in the art would not have applied this teaching of the Burton et al. reference to Hartog's superpolishing process and slurry which do not present the problem of oxide erosion, i.e., Hartog's superpolishing process and slurry are utilized for polishing disk substrate surfaces that have no metal stacks to be damaged or destroyed by oxide erosion. As also argued in the Appeal Brief, the Examiner is taking this teaching of the Burton et al. reference and applying it outside of the context of oxidation erosion, which is the problem that the Burton et al. reference purports to solve by adding a surfactant to its metal CMP slurry. The Examiner responds to this line of argument in the Examiner's Answer by suggesting, without basis, that the oxide erosion problem is somehow present when using Hartog's superpolishing process and slurry to polish disk substrate surfaces and, hence, the Examiner contends that one of ordinary skill in the art would have been motivated to introduce Burton's surfactant into Hartog's superpolishing slurry so as to inhibit what the Examiner refers to as "metal erosion" (which is presumably the same as the "oxide erosion" defined in the Burton et al. reference).

Hartog's superpolishing process and slurry are utilized for polishing disk substrates made of various materials, including a substrate material which comprises aluminum coated with a layer of Nickel Phosphorous (NiP), as well as a glass substrate. See, for example, Hartog et al. col. 4, lines 12-16 and col. 7, lines 28-33. Contrary to the contention of the Examiner, one of ordinary skill in the art would not have been motivated to introduce Burton's surfactant into Hartog's superpolishing slurry so as to inhibit oxide erosion. Firstly, none of the various substrate materials taught in the Hartog et al. reference include metal stacks. Hence, there are no metal stacks present that could be damaged or destroyed by oxide erosion.

Secondly, one of ordinary skill in the art would not have been motivated to introduce Burton's surfactant into Hartog's superpolishing slurry so as to inhibit oxide erosion with respect to a glass substrate material. Hartog's glass substrate material (as opposed to Hartog's Al/NiP substrate material) is relevant here because the invention as set forth in claims 45-50 is directed to a self-cleaning colloidal slurry composition for superfinishing or finishing an aluminosilicate glass substrate for use in a disk drive data st

not have a metal coating and, hence, there is no metal coating that could be damaged or destroyed by oxide erosion. The possibility that Hartog's Al/NiP substrate material may be subject to oxide erosion is irrelevant with respect to Hartog's glass substrate material. One of ordinary skill in the art would not have been motivated to introduce Burton's surfactant into Hartog's superpolishing slurry so as to inhibit oxide erosion of Hartog's glass substrate material, which does not have a metal coating to be damaged or destroyed by oxide erosion.

Thirdly, the Hartog et al. reference discloses using its superpolishing process and slurry on disk *substrates* to provide surfaces of near atomic smoothness. See, for example, Hartog et al. col. 2, lines 40-50 and col. 3, lines 47-50. The Hartog et al. reference does not disclose or suggest using its superpolishing process and slurry on *disks* (i.e., disk substrates that have been coated with a magnetic material). See, for example, Hartog et al. col. 3, lines 47-54. Hence, the glass substrate taught by the Hartog et al. reference is subjected to Hartog's superpolishing process and slurry before (and only before) a magnetic material is deposited thereon. Only after the glass substrate is subjected to Hartog's superpolishing process and slurry, is the glass substrate coated with a magnetic material. Significantly, the underlying purpose of superpolishing processes and slurry compositions such as those disclosed in the Hartog et al. reference is to remove irregular surface morphology from the disk substrate that would otherwise be replicated in layers, such as the magnetic layer, subsequently deposited onto the disk substrate. See, for example, page 2, lines 2-5 of the present application. Therefore, one of ordinary skill in the art would not have been motivated to introduce the Burton's surfactant into Hartog's polishing composition for the purpose of inhibiting oxide erosion on a glass substrate, since no metal coating (e.g., a magnetic layer) is present on the glass substrate to erode.

## Conclusion

The Appellant respectfully submits that claims 41-50 are patentable over the cited art references, and the rejections thereof under 35 U.S.C. 103(a) should be reversed for the reasons set forth herein and in the Appeal Brief filed December 27, 2006.

**CERTIFICATE OF MAIL TRANSMISSION**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date indicated below.

May 16, 2007
(Date of Deposit)

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Respectfully submitted,

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